

Serial No. 10/649,289
Inventor Name: Allan J. Wildey
Title: Steering System for Articulated Vehicles
Docket No. 900260.90200

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-3. (Cancelled)

4. (Currently Amended) A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid actuated hydraulic valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) an operator controlled steering input device;
- f) a processor communicatively connected to the proportional solenoid valve and to the steering input device to control the valve in response to inputs from the steering input device; and
- g) a sensitivity selector ~~including a gear selector sensor for determining~~ configured to determine a desired steering sensitivity setting, which is a desired steering response to a given operator input to the steering input device, the sensitivity selector being communicatively connected to the processor to provide an input signal to the processor that causes the processor to vary the signal output to the valve in accordance with the input signal from the sensitivity selector, wherein the setting of the sensitivity selector is determined by what gear the vehicle is in.

5-11. (Cancelled)

12. (Currently Amended) A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid actuated hydraulic valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) an operator controlled steering input device;
- f) a processor communicatively connected to the proportional solenoid valve and to the steering input device to control the valve in response to inputs from the steering input device; and
- g) a sensitivity selector ~~for determining~~ configured to determine a desired steering sensitivity setting, which is a desired steering response to a given operator input to the steering input device, the sensitivity selector being communicatively connected to the processor to provide an input signal to the processor that causes the processor to vary the signal output to the valve in accordance therewith, wherein the setting of the sensitivity selector is determined directly by an operator, further comprising an operator input device communicatively connected to the processor ~~for allowing~~ and configured to allow an operator to input a tire size, wherein the processor determines an maximum allowable articulation angle between the first frame and the second frame based on the tire size input by the operator, and wherein the processor controls the valve to prevent articulation of the first frame and the second frame past the maximum allowable articulation angle.

13-14. (Cancelled)

15. (Currently Amended) A steering system for an articulated vehicle as recited in claim 12, wherein the processor controls the valve to slow down articulation as the ~~maximum~~ allowable articulation angle is approached.

16-18. (Cancelled)

19. (Currently Amended) A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) an operator controlled steering input device;
- f) an input device [[for]] configured to allow an operator to input tire size;
- g) a processor communicatively connected to the proportional solenoid valve and to the steering input device to control the valve in response to inputs from the steering input device;
- h) wherein the processor controls the valve so as not to exceed an ~~maximum~~ allowable articulation angle between the first and second frames which the processor sets based on the tire size input by the operator.

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Docket No. 900260.90200

20. (Currently Amended) A steering system for an articulated vehicle, comprising:

- a) a first frame;
- b) a second frame pivotally connected to the first frame by a pivot joint;
- c) at least one hydraulic cylinder, connected between the first frame and the second frame and spanning the pivot joint, to articulate the first frame and the second frame relative to one another;
- d) a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder;
- e) an operator controlled steering input device;
- f) a processor;
- g) an interface operatively connecting the steering input device to the processor;
- h) wherein the processor operates the proportional solenoid valve in response to inputs from the steering input device;
- i) wherein the interface is the same for different types of steering input devices configured to be used with a plurality of types of steering input devices.

21-22. (Cancelled)

Serial No. 10/649,289

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Title: Steering System for Articulated Vehicles

Docket No. 900260.90200

23. (Withdrawn) A method for steering an articulated vehicle having a first frame, a second frame pivotally connected to the first frame by a pivot joint, at least one hydraulic cylinder connected between the first frame and the second frame and spanning the pivot joint to articulate the first frame and the second frame relative to one another, a proportional solenoid valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder, an operator controlled steering device operable to produce steering signals, and a processor communicatively connected to the proportional solenoid valve and to the steering input device, the method comprising:

producing steering signals in response to mechanical steering inputs from an operator,

communicating the steering signals to the processor, and

controlling the valve in response to the steering signals to align axes of the first frame and the second frame to be generally parallel from a generally non-parallel position when the steering input device is returned to a center position.

Serial No. 10/649,289

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Docket No. 900260.90200

24. (Withdrawn) A method for steering an articulated vehicle having a first frame, a second frame pivotally connected to the first frame by a pivot joint, at least one hydraulic cylinder connected between the first frame and the second frame and spanning the pivot joint to articulate the first frame and the second frame relative to one another, a proportional solenoid steering valve in communication with the hydraulic cylinders to control the flow of hydraulic fluid to the hydraulic cylinder, at least one other solenoid valve to control at least one other function, a source of pressurized hydraulic fluid which supplies hydraulic fluid under pressure to both of the valves, an operator controlled steering device operable to produce steering signals, and a processor communicatively connected to the proportional solenoid steering valve, the at least one other solenoid valve, and to the steering input device, the method comprising,

producing steering signals in response to mechanical steering inputs from an operator,

communicating the steering signals to the processor, and
controlling the steering valve in response to inputs from the steering input device, and giving priority to flow from the source of hydraulic fluid to the steering valve over flow from the source of hydraulic fluid to the at least one other solenoid valve.